



Docket No.: 1454.1629

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the Application of:

Martin BOSSERT et al.

Serial No. 10/553,411

Group Art Unit: 2618

Confirmation No. 3710

Filed: October 17, 2005

Examiner: Unknown

For: METHOD AND TRANSMITTER FOR TRANSMITTING DATA IN A MULTI-CARRIER  
SYSTEM VIA A NUMBER OF TRANSMITTING ANTENNAS

**PRE-APPEAL BRIEF CONFERENCE REQUEST**

**Mail Stop AF**

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

Applicants request review of the final rejection in the above-identified application. No amendments are being filed with this request. This request is being filed with a Notice of Appeal. The review is requested for the following reasons:

**THE REJECTIONS ARE IMPROPER BECAUSE THE OFFICE ACTION IGNORES EXPRESS  
CLAIM ELEMENTS**

In the Office Action mailed October 10, 2008, claims 9-20 are rejected as allegedly being anticipated by U.S. Patent No. 6,785,520 to Sugar et al. (hereinafter "Sugar").

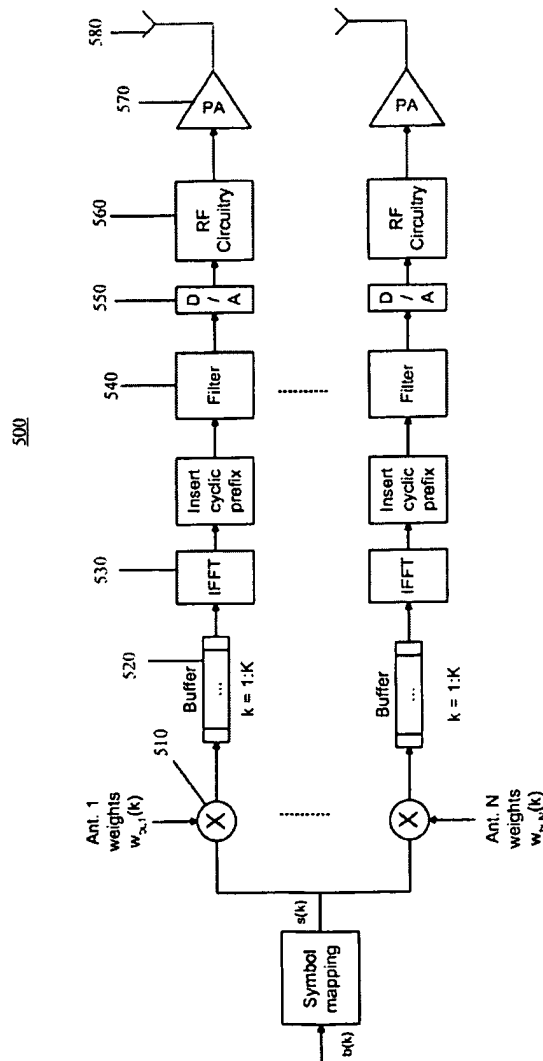
Appellants have argued in the Amendment filed June 26, 2008, that independent claim 9 patentably distinguishing over Sugar at least by reciting "for each antenna, assigning each element to a subcarrier for transmission, such that for at least two antennas and at least one subcarrier, different elements are assigned to said one subcarrier." The Office Action mailed October 10, 2008 does not respond to the arguments and repeats verbatim the rejection of claim 9 from the previous Office Action.

For clarity of the explanation appellants refer herewith to FIG. 1, but the claim is not limited by the embodiment illustrated in FIG. 1. The elements S1, S2, S3 are input to three different branches to be transmitted via the antenna TX1, TX2, TX3. Each antenna uses a plurality of subcarriers for radio transmission. In the conventional manner of transmitting data, a

first data element S1 is assigned to subcarrier 1, a second data element S2 is assigned to subcarrier 2, etc, the same data element for the same carrier in each of the antennas TX1, TX2, TX3. However, claim 9, explicitly requires “assigning each element to a subcarrier for transmission, such that for at least two antennas and at least one subcarrier, different elements are assigned to said one subcarrier.” In this assignment of the data elements per subcarriers performed for in the manner specified in claim 9, a shift of the elements occurs (see e.g. rearrangement pattern a2 applied to S data in FIG. 1, and explained in paragraph 0025 of the specification). Although not explicitly recited in the claim, the assignment of data elements to subcarriers (i.e. frequencies) inherently occurs prior to the OFDM modulation, which transforms the signals from frequency domain to time domain.

The Office Action alleges that the above-identified feature of claim is anticipated by FIG. 8 (reproduced below) and col. 7, lines 20-51 of Sugar.

FIG. 8



Sugar discloses data symbols  $s(k)$  transmitted on each of the  $N$  antenna using  $K$  subcarriers **without any assignment/reordering**. Sugar teaches that each symbol is multiplied by a transmit antenna weight (see 510 above), and, after the FFT (530), the signal in time domain is multiplied by a phase factor (see the block "Insert cyclic prefix" between 530 and 540 in FIG. 8 of Sugar). However, neither the multiplication with the antenna weight nor the cyclic prefix has the effect of changing the order of the symbols per carriers such that "for at least two antennas and at least one subcarrier, different elements are assigned to said one subcarrier" as recited in claim 9. The multiplication with the antenna weight merely affects the antenna power (see Sugar, col. 3, line 62 and col. 9, lines 20-44). The cyclic prefix of Sugar is applied to the signal in time domain not in frequency domain and does not have the effect of changing order of data elements. Therefore, Sugar fails to anticipate the above-identified feature recited in claim 9.

Based on similar arguments, independent claim 13 patentably distinguishes over the cited prior art at least by reciting "for each antenna, assigning each element to a subcarrier for transmission, such that for at least two antennas and at least one subcarrier, different elements are assigned to said one subcarrier."

Additionally, Appellants have argued in the Amendment filed June 26, 2008, that independent claim 13 also distinguishes over Sugar by reciting "for at least one antenna, rearranging the order of the time-dependent signals after OFDM modulation." For illustration purposes, see b2 and b3 in FIG. 1 described in paragraph [0031] of the specification.

The "Response to Arguments" section of the outstanding Office Action states:

The argued features in the remark about rearrangement of the time-dependent signals after the OFDM modulation reads upon Sugar as Sugar teaches the OFDM modulation for transmitting data over subcarriers via different antennas and represented in form of a vector matrix of different elements of OFDM subcarriers signals, and these elements are adjusted in a cyclic manner (see col 4 lines 15-40, col 7 lines 20-67), thus Sugar discloses the rearrangement of signals when using the OFDM modulation.

Applicants respectfully submit that the multiplication with an antenna weight factor (see col. 4 lines 15-40) occurs before OFDM and thus does not meet the "after OFDM modulation" condition. The "adjustment made for cyclic prefixes caused by the OFDM process" (see col. 7, lines 40-41 of Sugar) does not have the effect of "rearranging the order of time-dependent signals" as recited in claim 13.

In view of the above arguments relative to claims 9 and 13, independent claim 20 patentably distinguishes over the cited prior art at least by reciting at least by reciting

- assignment means for assigning each element to a corresponding subcarrier, the elements being assigned individually for each antenna such that for at least two antennas and at least one subcarrier, different elements are assigned to said one subcarrier; and
- the transmitter comprises either: multiplication means for multiplying each element for each antenna by an antenna-specific and element-specific factor before OFDM modulation (OFDM), or rearrangement means for rearranging the order of the time-dependent signals after OFDM modulation.

## CONCLUSION

Accordingly, the Applicants respectfully submit that the Examiner's rejections are clearly without basis and should be withdrawn. Further, the Applicants respectfully request that the Office issue a finding that the application is allowed on the existing claims and that prosecution remains closed.

Respectfully submitted,

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Jan. 15, 2009

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